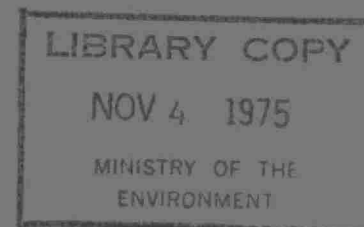


OPERATING SUMMARY

CITY OF
WATERLOO
WATER POLLUTION CONTROL PLANT

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MANAGER, UTILITY OPERATIONS
B. Hansler

WATERLOO
WATER POLLUTION CONTROL PLANT

operated for
THE CITY OF WATERLOO
by the
MINISTRY OF THE ENVIRONMENT

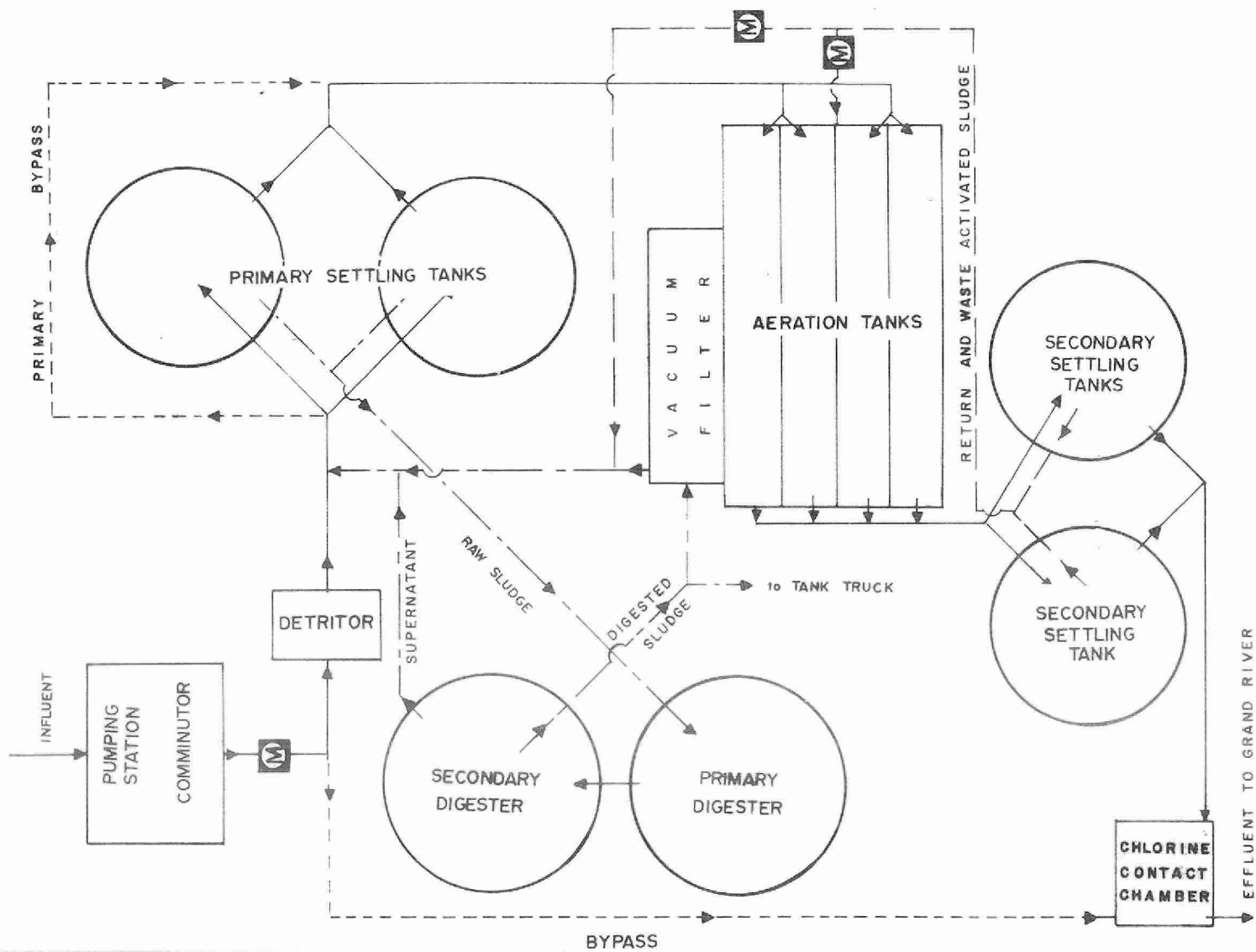
1974 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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CITY OF WATERLOO WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT City of Waterloo WPCP

PROJECT NOS. 2-0022-58
2-0203-66

DESIGN FLOW 6.0 mgd*

DESIGN POPULATION 30,000

BOD - Raw Sewage 300 mg/l
- Removal 90%

SS - Raw Sewage 270 mg/l
- Removal 90%

PRIMARY TREATMENT

Comminution

One Worthington

Sewage Lift Station

Type: Canada Pump
Size: Two 2900 gpm @ 32' tdh (el)
One 5000 gpm @ 32' tdh (diesel)

Grit Removal

Type: Dorr Detritor
Size: Two 14' x 14' x 1.6' (3,900 gal)
Retention: 0.94 min

Primary Sedimentation

Type: Dorr
Size: Two 75' dia x 13' swd
Ret (0.772 mil gal)
Loading: Surface, 680 gal/ft
Weir, 12,700 gal/d
Retention: 3.09 hours
Loading: Surface, 680 gal/ft²/day
Weir, 12,700 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air, single-pass with
turbine aerators
Size: Four 134' x 32½' x 15½' (1.68 m
Ret (1.68 mil gal)
Retention: 6.7 hours

Diffusers

(a) Spargers (66/tank)
(b) "Lightnin" Turbine (3/tank)

Air Supply

Type: Sutorbilt
Size: Two 3,750 cfm

Secondary Sedimentation

Type: Dorr
Size: Two 65' dia x 10' swd
(0.458 mil gal)
Retention: 1.8 hours
Loading: Surface, 905 gal/ft²/day
Weir, 14,650 gal/ft/day

CHLORINATION

Type: BIF
Size: One 400 lb/day

OUTFALL

- to Grand River

SLUDGE HANDLING

Digestion System - Two-stage

Primary - fixed cover
Type: Dorr draft tubes (3)
Size: One 80' x 21½' swd
(124,500 cu ft or 0.776 mil gal)
Loading: 3.5 lb/cu ft/mo

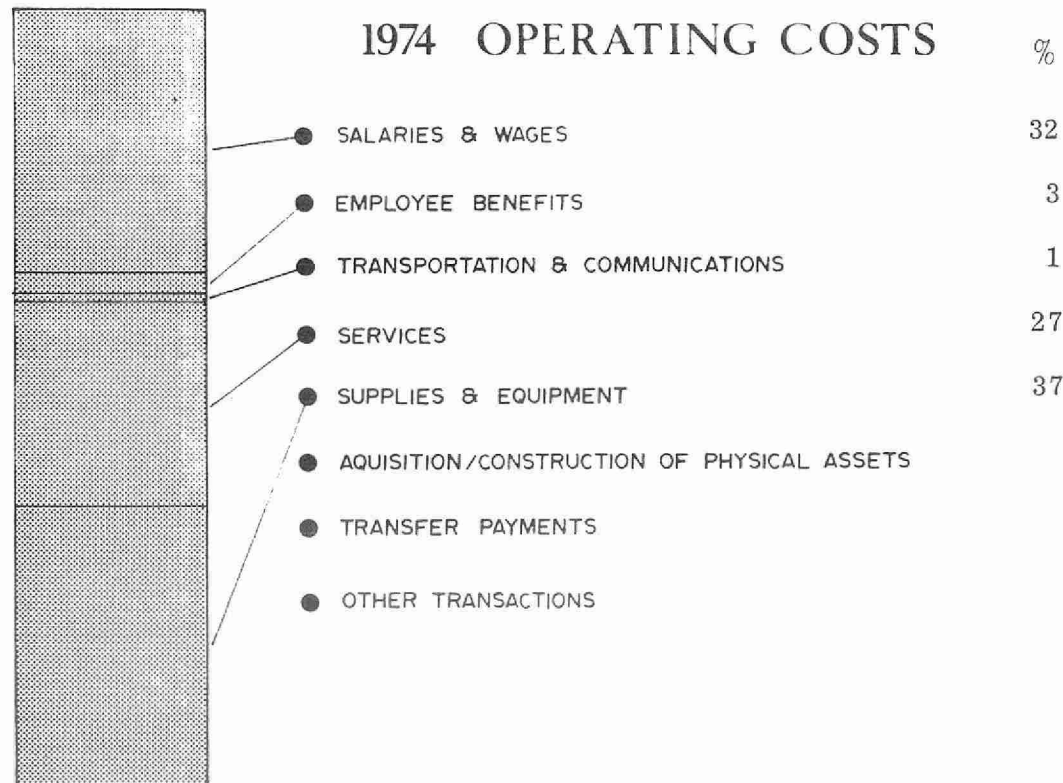
Secondary -
Size: One 80' dia x 20' swd
(117,000 cu ft or 0.73 mil gal)
Total Loading: 1.8 lb/cu ft/mo

Vacuum Filter

Type: Komline-Sanderson
Size: One 300 sq ft

* Secondary clarifier 4.0 mgd
design rate

ANNUAL COSTS



YEARLY OPERATING COSTS

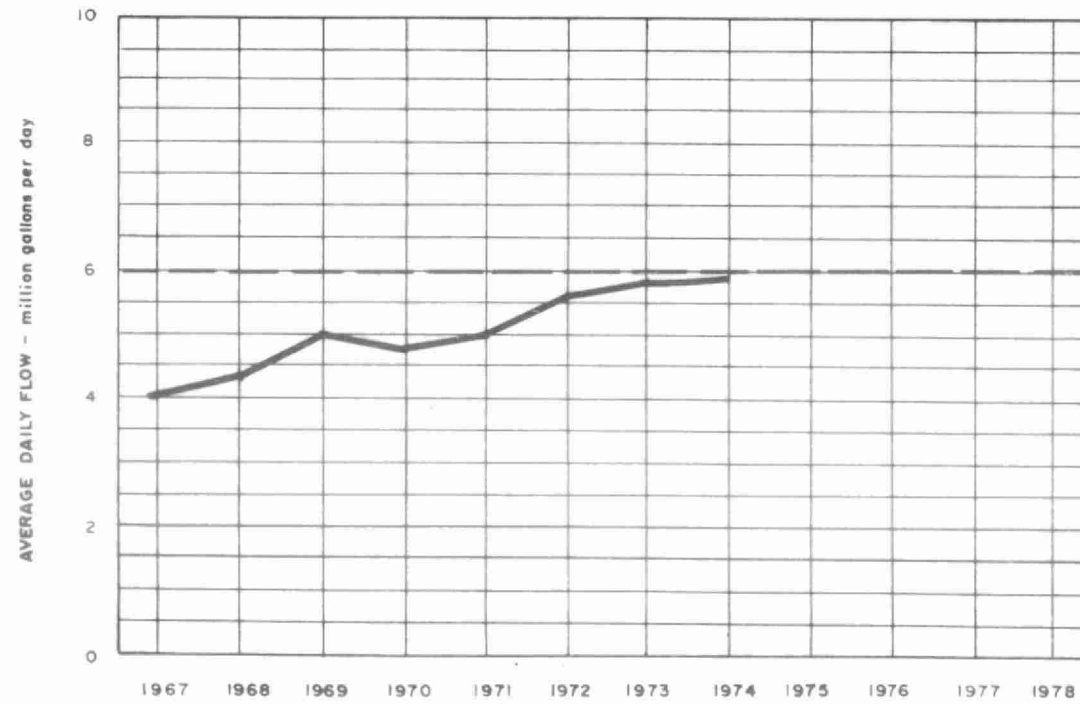
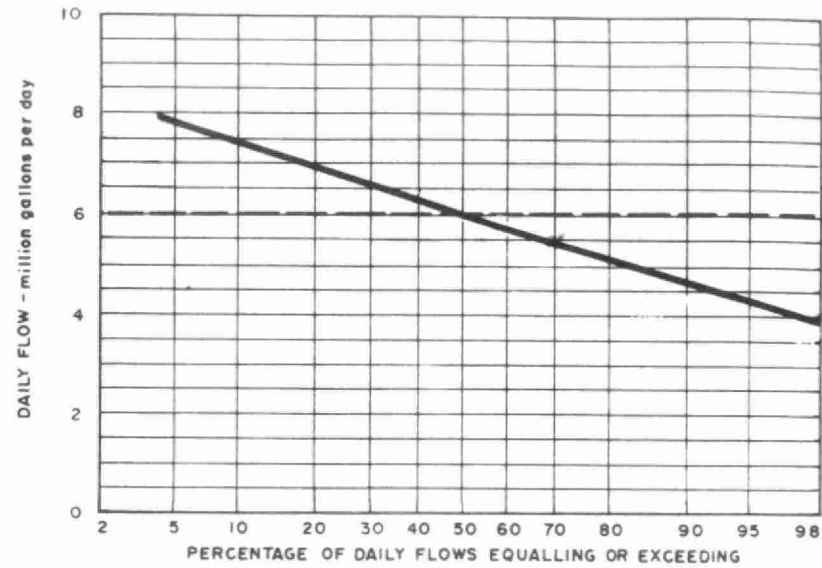
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1969	1891.	152,659	84	3
1970	1784.	166,391	93	3
1971	1903.	176,260	93	4
1972	2058.	172,223	84	4
1973	2137.	169,299	79	4
1974	2154.	252,672	117	5

OPERATING EXPENDITURES

Regular Staff	\$ 75,801	\$
Casual (Unclassified) Staff	<u>3,465</u>	
TOTAL SALARIES AND WAGES		<u>79,266</u>
TOTAL EMPLOYEE BENEFITS		<u>7,867</u>
TOTAL TRANSPORTATION AND COMMUNICATIONS		<u>2,697</u>
Insurance	<u>4,509</u>	
Sludge Haulage	<u>51,669</u>	
Repairs and Maintenance	<u>8,571</u>	
Other Services	<u>3,593</u>	
TOTAL SERVICES		<u>68,342</u>
Machinery and Equipment	<u>18,990</u>	
Chemicals	<u>22,175</u>	
Utilities	<u>47,425</u>	
Other Supplies and Equipment	<u>5,910</u>	
TOTAL SUPPLIES AND EQUIPMENT		<u>94,500</u>
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		<u>-</u>
TOTAL TRANSFER PAYMENTS		<u>-</u>
OTHER TRANSACTIONS		<u>-</u>
GRAND TOTAL	GRAND TOTAL	\$ <u>252,672</u>

PROCESS DATA

FLOWS

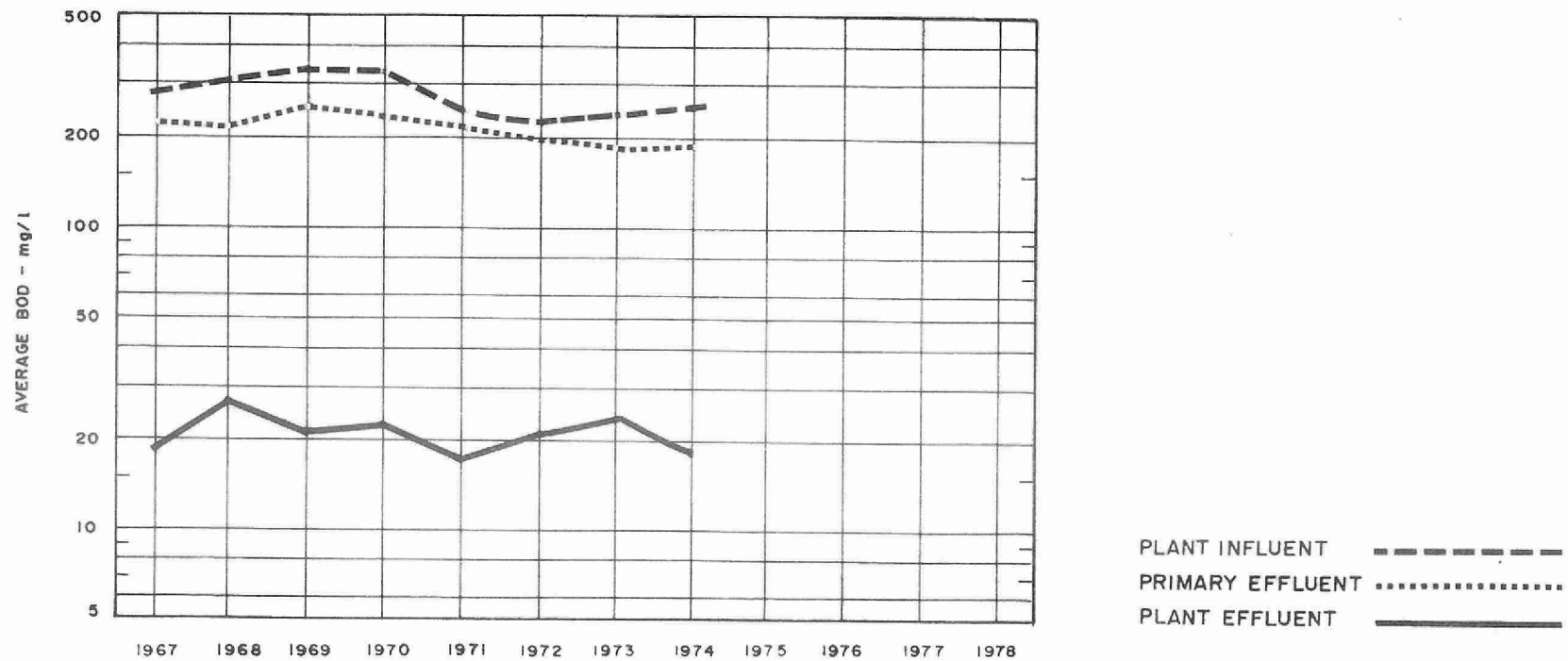
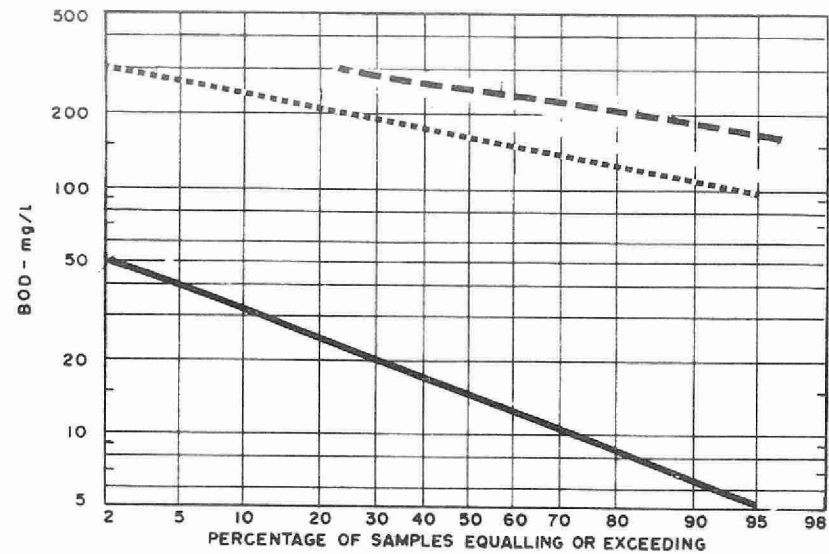


DESIGN CAPACITY - - - - -

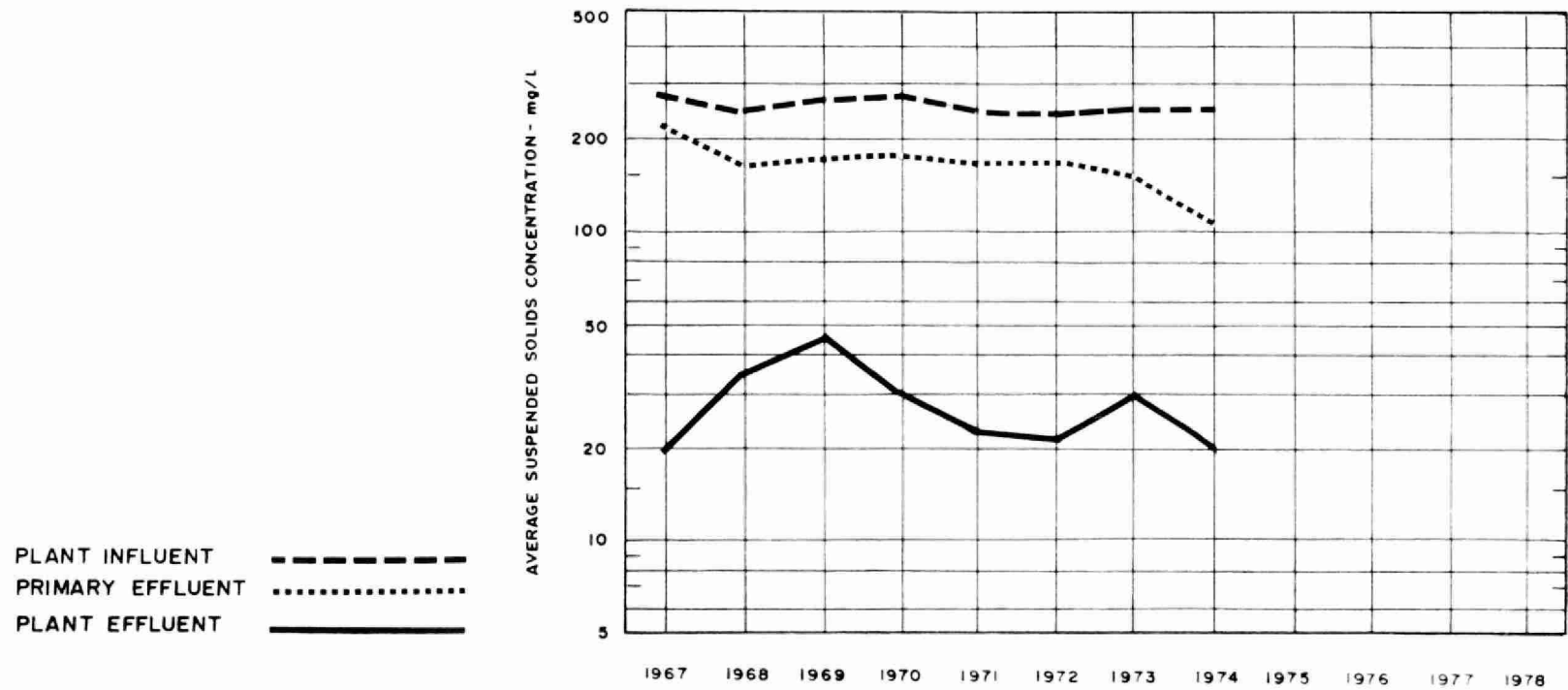
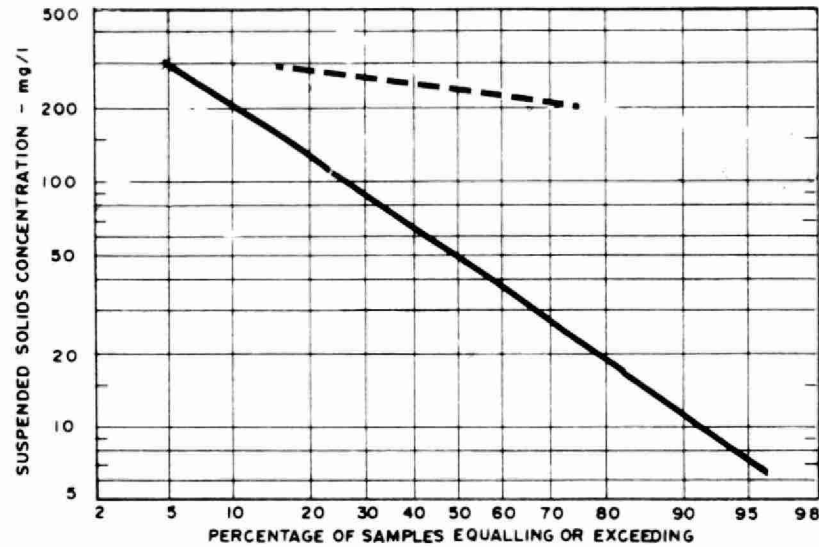
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	198	6.38	8.46	159	12	92	291	200	12	94	372	5.4	.3
FEB	174	6.23	9.49	204	20	90	321	225	38	83	326	5.5	.7
MAR	209	6.75	10.45	252	10	96	506	213	27	87	389	6.4	.6
APR	206	6.88	9.04	248	13	95	485	216	17	92	410	5.1	.9
MAY	162	6.74	8.32	260	14	95	398	219	13	94	333	6.0	.7
JUNE	167	5.57	6.55					220	17	92	339		
JULY	167	5.39	6.37	264	11	96	423	242	13	95	383	5.6	.6
AUG	170	5.49	8.00	264	11	96	430	263	15	94	422	7.6	.5
SEPT	167	5.39	10.07	307	16	95	486	304	12	96	488	6.4	.8
OCT	184	5.92	11.70	264	12	95	462	254	9	96	450	5.7	.6
NOV	186	6.19	7.60	270	64	76	383	257	42	84	399	6.0	5.4
DEC	164	5.28	7.40	282	19	93	431	243	15	94	373	6.5	1.2
TOTAL	2154	-	-	-	-	-		-	-	-	4734	-	-
AVG.	186	5.90	MAXIMUM 11.70	250	18	93	454	240	20	92	395	6.1	1.2
No. of Samples	-	-	-	93	94	-	-	213	212	-	-	86	82

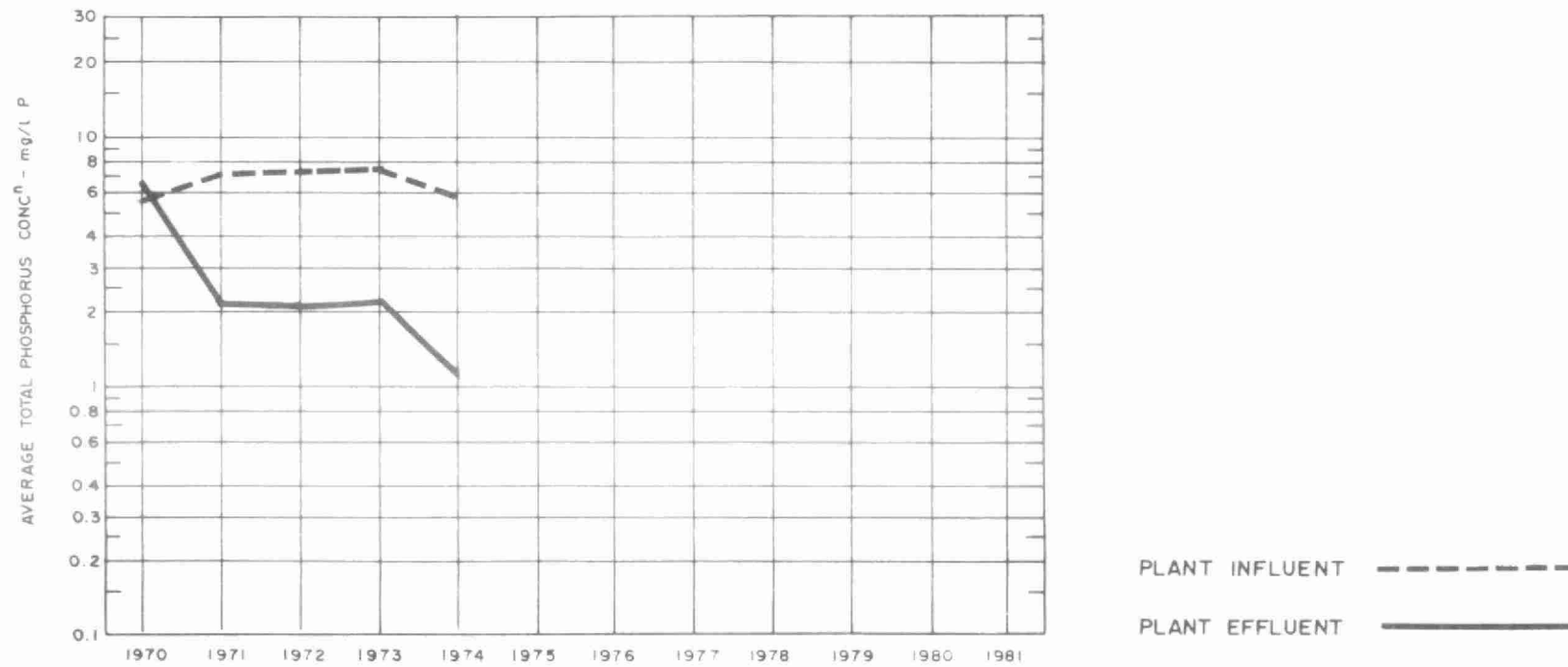
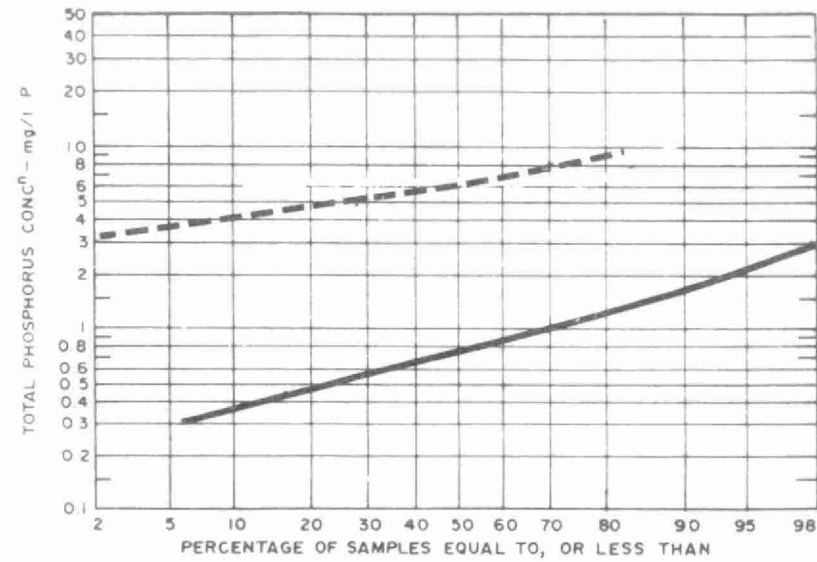
BIOCHEMICAL OXYGEN DEMAND



SUSPENDED SOLIDS

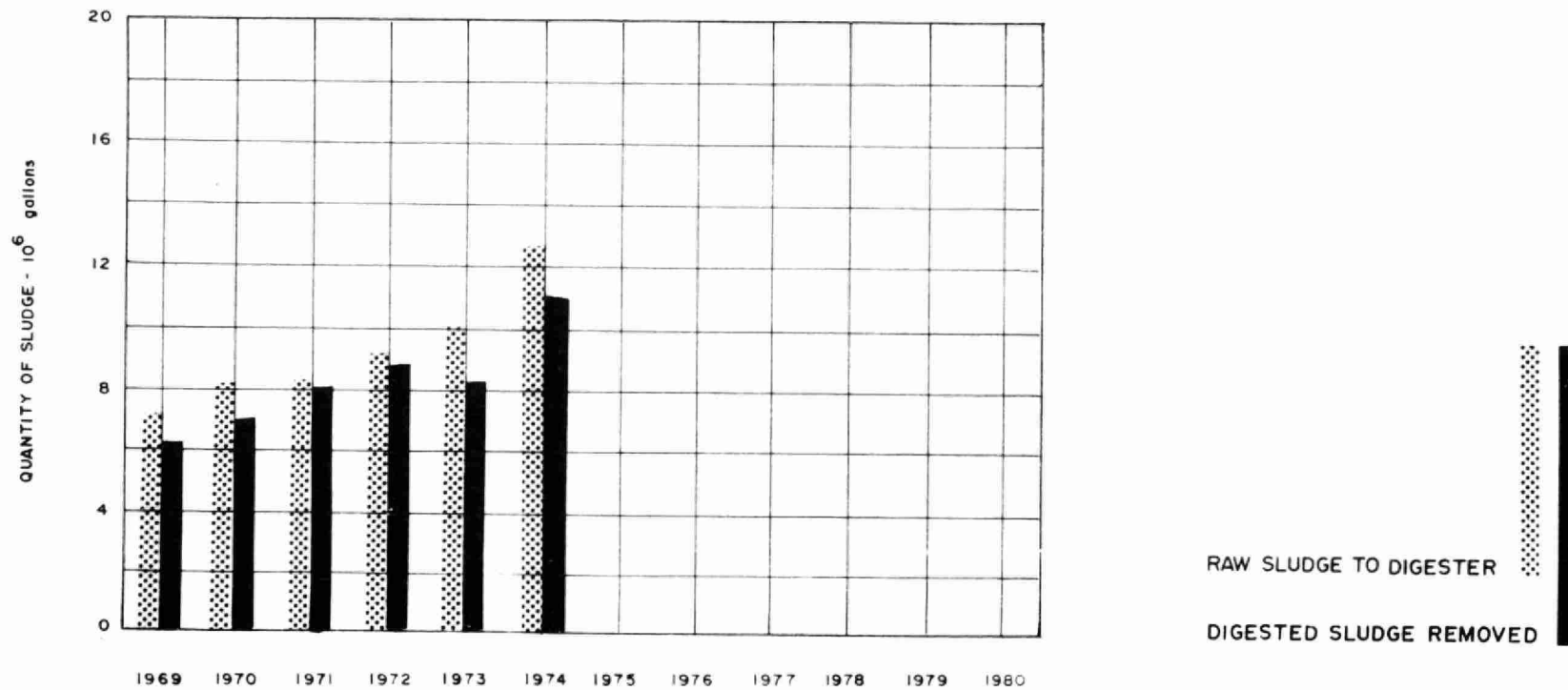
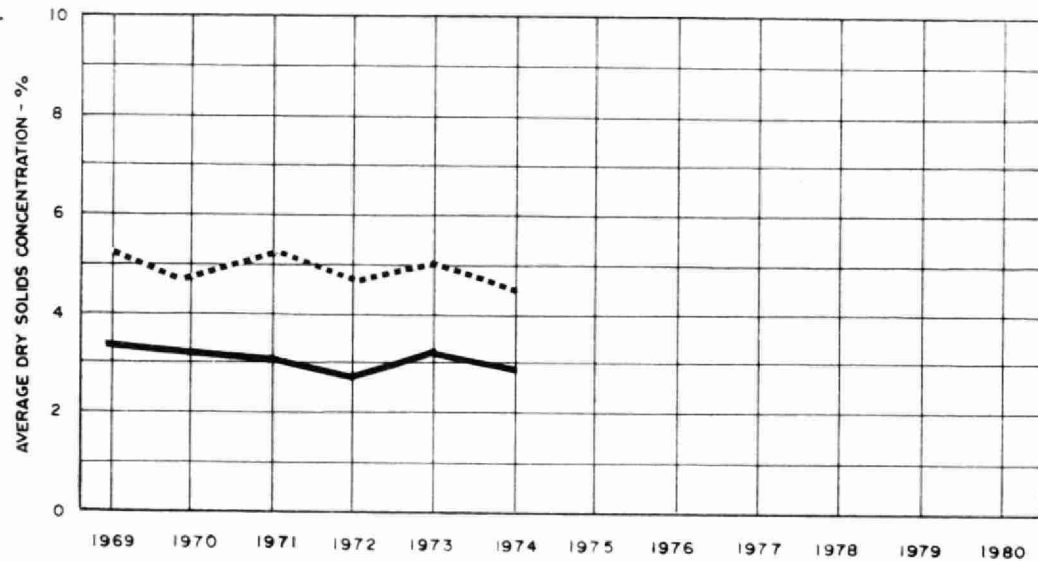


PHOSPHORUS



DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———



TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ⁵ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 ⁵ gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	143	7.6	3.8	151	109	2600	.22	.6	8.3	4.7	68	6.8	2.0	55		4136
FEB	165	6.8	3.9	166	95	2600	.23	.6	9.5	5.7	62	6.2	2.3			3697
MAR	180	7.6	3.6	182	116	2700	.26	.5	11.6	5.1	63	9.3	2.6		1.6	5474
APR	72	7.4	3.6	150	104	2700	.23	.6	10.4	5.0	68	7.8	2.4	50		4539
MAY	135	5.8	3.6	173	91	2600	.26	.5	7.6	4.6	63	5.9	2.8	51		3589
JUNE	153	7.6	4.6		100	2900			8.4			7.7	3.1			4464
JULY	163	4.3	2.6	142	100	2700	.17	.7	10.7	4.2	59	9.6	3.2	48		5744
AUG	104	3.7	2.2	188	96	2700	.23	.6	12.1	4.0	63	11.6	3.6	50		6912
SEPT	131	3.7	2.2	208	97	2700	.28	.5	10.8	3.3	58	9.9	3.3	49		5920
OCT	75	3.7	2.0	196	100	2600	.27	.5	11.3	4.3	67	12.0	2.9	54		6944
NOV	75	4.4	2.4	248	109	2400	.38	.5	12.3			10.5	2.7	55		6272
DEC	213	6.0	3.7	168	104	2600	.18	.7	13.8	3.9	67	13.4	2.5	57		7994
TOTAL	1609	65.6	-	-	-	-	-	-	126.8	-	-	110.7	-	-	-	65685
AVG.	.8 cu. ft/mil gal	55	3.0	181	102	2600	.23	.6	10.6	4.5	64	9.2	2.8	52	1.6	1967

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